Ontario

ORDER NO. 91-009
FEBRUARY 1991
AGDEX 110/632

Factsheet

COMMON BARBERRY AND EUROPEAN BUCKTHORN ALTERNATE HOSTS OF CEREAL RUST DISEASES

(Replaces Publication 48 "Rid Ontario of Common Barberry and European Buckthorn")

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Stem rust and crown (leaf) rust cause significant yield losses and lowered grades of cereal grains. Losses are greatest when early season infections are caused by disease organisms that overwintered on alternate host plants growing near the field. **Stem rust**, which attacks oats, barley, spring wheat and rye, requires **common barberry** as its alternate host. **Crown rust** (also call leaf rust) of oats requires **European buckthorn** for its alternate host.

In the spring, the overwintering form of stem rust on cereal trash lying on the soil surface produces spores that can only infect young leaves of barberry. The rust fungus develops cluster cups on the leaves of the barberry and produce millions of spores capable of infecting grain plants early in the growing season. **If common barberry is not present, infection does not occur until later in the growing season.** Late season infections are caused by airborne stem-rust spores blown in to Ontario from infected fields in the southern United States. These later infections are less likely to cause serious losses.

The sexual stage of the stem-rust fungus develops on common barberry. During this stage different strains of the fungus cross to produce new strains of rust. These may be able to infect grain varieties that now have stem rust resistance. This is the most important reason for controlling common barberry in Ontario.

European buckthorn serves as the alternate host for the fungus causing crown rust of oats. Its life cycle is similar to that of stem rust. Similarily, if European Buckthorn is not present, infection of oats by crown rust will not occur until later in the season.

COMMON BARBERRY

Common barberry *(Berberis vulgaris L.)* is a spiny, graceful shrub which grows from 1 to 4 meters tall, with arching branches and grey outer bark. The leaves are bright green somewhat oval, from 2 to 8 cm long, and have bristle-toothed edges. Spines on the branches usually are three-pronged. Flowers are small, yellow, and borne in long, drooping clusters. Berries are oblong, red and sour. There is also a purple leaved variety of common barberry.

Common barberry is responsible for stem-rust fungus and severe outbreaks of stem rust on oats, barley, rye and wheat.

Figure 1. COMMON BARBERRY

Common barberry was originally grown as an ornamental shrub. It has escaped from cultivation and now grows wild in many locations. Hybrids between common barberry and other barberries are found in Ontario. These plants have some of the characteristics of common barberry and some of the other parent. Therefore some hybrids are infected by the stem rust fungus while others are not. If the leaves bear the yellow cluster cups of the stem rust fungus they are susceptible. All such plants should be destroyed as

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they can produce seedlings that can be infected by the stem rust.

Japanese Barberry

Several kinds of ornamental barberry may be present in Ontario. Although Agriculture Canada does not now permit the importation or sale of any deciduous barberry, plantings were made in the past. The most widely planted of these is the Japanese barberry (*Berberis thunbergii* D.C.). The Japanese barberry is more spreading than common barberry and usually no more than 1 or 2 meters tall. The outer bark is reddish-brown, the leaves are green or red with smooth edges, and the spines on the branches are usually single. The flowers and fruits are borne singly, or in twos, threes, or fours, and the berries are shorter and plumper than those of common barberry.

EUROPEAN BUCKTHORN

European buckthorn (*Rhamnus cathartica L.*) is a shrub or small tree from 2 to 6 meters tall. Many of the small branches that are one year or older end in a sharp thorn, and where a branch forks into two branches, there is usually a thorn in the middle of the fork. The leaves are arranged opposite each other, or nearly so, and are more or less oval. Leaves stay green late in the fall, even later than wild apple leaves. This helps to identify the plant at that time. The main veins on each side of the mid rib of the leaves tend to curve and point toward the tip of the leaf rather than to the edge of the leaf. The black, round berries are born on short stalks clustered among the leaves on the branches, not in hanging bunches. Each berry has 2 or 3 hard seeds. They are very bitter and extremely cathartic.

Figure 2. EUROPEAN BUCKTHORN

CONTROL

Both common barberry and European buckthorn were imported for use as ornamental shrubs and both have been planted as hedges. Berries of both are eaten by birds who spread the seeds in their droppings. Look for individual plants or thickets along fences, roadsides, wasteland in pastures, along the edges of woodlots and on banks of streams and lakes. Pay special attention to abandoned homesteads where these plants may have been cultivated.

Rust spores are blown quite a distance from the barberry and buckthorn plants and can easily move from one farm to another. Control of either species must be done on a community wide basis to be effective. The best method of control of barberry and buckthorn will depend on the size of the bushes, where they are growing, proximity to susceptible crops or ornamental vegetation, equipment available and the size of the control program. When a plant is destroyed the area where it was growing should be checked for several years to control any new growth from seeds or roots. Birds can spread seeds over several farms so remaining shrubs can cause reinfestation.

Small isolated plants can be pulled or dug out. Cutting of larger bushes or thickets is difficult due to the spines and thorns of the plants. New shoots grow quickly from cut stumps. Therefore repeated cutting, stump removal or chemical treatment of cut stumps may be required.

CHEMICAL CONTROL

Methods of chemical control of common barberry and European buckthorn are listed in the "Brush Control" section of Publication 75 – "Guide to Weed Control". Always use chemicals according to label directions and follow all safety precautions.

Basal-bark Treatments in Oil as a Carrier

A small hand sprayer or a power sprayer can be used to spray the bottom 30 cm of the trunks and any exposed roots. Wet the bark thoroughly on all sides of the trunks. This treatment is useful on trees with a trunk diameter of up to 15 cm.

Stump Treatment After Cutting

It is often desirable to cut and remove the shrubs for appearance sake. Spray or paint the freshly cut stumps with an approved herbicide. Killing the stump is the first step towards encouraging it to rot and helps prevent regrowth from the stump.

Stem-foliage treatments applied to "runoff"

Bushes less than 2 meters tall can be sprayed just as the leaves reach full size, usually in late spring to early summer. Spray to wet all stems and foliage thoroughly. Plants taller than 2 meters should be cut as it is difficult to spray tall shrubs thoroughly and there is an increased risk of spray drift.

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ISSN 0225-7882